

# इंटरनेट

# मानक

## Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 4572 (1992): Polyamide multifilament ropes (Hawser-laid and plaited) [TXD 9: Cordage]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE



IS 4572 : 1992  
[ Amalgamating IS 4572 ( Part 1 ) : 1982,  
IS 4572 ( Part 2 ) : 1983, IS 4572 ( Part 3 ) :  
1983 and IS 4572 ( Part 4 ) : 1982 ]

भारतीय मानक

पॉलीएमाइड बहुतन्तु वाली रस्सियाँ  
( हॉसर निहित तथा बटदार ) – विशिष्ट  
( तीसरा पुनरीक्षण )

*Indian Standard*

POLYAMIDE MULTIFILAMENT ROPES  
( HAWSER-LAID AND PLAITED ) —  
SPECIFICATION

*( Third Revision )*

UDC 677.072.688 : 677.494.675

© BIS 1992

BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

December 1992

Price Group 2

## FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Cordage Sectional Committee had been approved by the Textile Division Council.

This Indian Standard is the revision of the following Indian Standards:

IS 4572	Polyamide multifilament ropes
( Part 1 ) : 1982	General requirement for hawser-laid and plaited ropes ( <i>second revision</i> ),
( Part 2 ) : 1983	Hawser-laid ropes for specific applications ( <i>second revision</i> )
( Part 3 ) : 1983	Hawser-laid ropes for general purposes ( <i>second revision</i> )
( Part 4 ) : 1982	8-strand plaited

While preparing this standard all the above standards have been amalgamated into one standard. Following major changes have been carried out in this revision so as to align this standard with corresponding draft International Standard ISO/DIS 1140 Ropes — Polyamide — Specification:

- a) Dimensional characteristic of this rope is only linear density. Nominal diameter in mm referred as reference number is only meant for use as designation in commercial dealings.
- b) Values of maximum pitch or length of lay have been modified.
- c) Tolerance of linear density has also been modified and related to reference number.
- d) Value of minimum breaking load has also been modified.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values ( *revised* )'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

**AMENDMENT NO. 1 MARCH 2002**  
**TO**  
**IS 4572 : 1992 POLYAMIDE MULTIFILAMENT ROPES**  
**(HAWSER-LAID AND PLAITED) — SPECIFICATION**  
*(Third Revision)*

( *Page 3, Table 2, Heading of col 4* ) — Substitute the following for the existing:

‘Pitch, *Max*  
Length of Lay’

( *Page 3, Table 2, Size No. 13, col 3* ) — Substitute ‘1 465’ for ‘1 425.’

( TX 09 )

---

Reprography Unit, BIS, New Delhi, India

*Indian Standard*

# POLYAMIDE MULTIFILAMENT ROPES ( HAWSER-LAID AND PLAITED ) — SPECIFICATION

*( Third Revision )***1 SCOPE**

This standard specifies the requirements of 3-strand hawser-laid ropes and 8-strand plaited ropes made from continuous multifilament belonging to polyamide group.

**2 REFERENCES**

The Indian Standards listed in Annex A are necessary adjuncts to this standard.

**3 TERMINOLOGY**

For the purpose of this standard, the definition given in IS 3871 : 1984 shall apply.

**4 ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTS**

The test shall be carried out under prevailing atmospheric conditions. In all cases of dispute, however, the tests shall be carried out on samples which have been conditioned for 24 hours in a standard atmosphere at  $65 \pm 2$  per cent relative humidity and  $27 \pm 2^\circ\text{C}$  temperature ( see IS 6359 : 1971 ).

When practicable the test shall be carried out in the standard conditioning atmosphere. Otherwise, they shall be carried out as quickly as possible and time lapse not exceeding 15 minutes between removal of the test piece from the conditioning atmosphere and testing.

**5 MANUFACTURE****5.1 Yarn**

The ropes shall be manufactured from polyamide continuous multifilament yarns.

**5.2 Construction**

**5.2.1** Unless otherwise specified hawser-laid ropes shall be manufactured from hawser-laid yarn twisted together with Z twist the standards themselves consisting of single yarns or Z twisted strands respectively.

**5.2.2** Unless otherwise specified 8-strand plaited ropes shall be manufactured from pairs of 4-strands each alternate pair consisting of two S twisted and two Z twisted strands respectively.

**5.2.3** The number of rope yarns in all the strands shall be same.

**5.3 Structure**

The ropes and their strands shall be continuous with splice.

**5.4 Treatment**

Ropes shall not contain more than 0.05 percent by mass of titanium dioxide. Ropes shall be subjected to heat treatment to fix lay and dimensional stability. The ropes shall generally be supplied in their natural state, that is, without any impregnation or coating treatment. If required by the purchaser, ropes may be impregnated or coated to establish particular characteristics. However, treatment shall not reduce the tensile strength of the rope.

**5.5 Rope**

The finished rope shall be flexible, well laid and free from defects in yarn, strand and finish.

**6 REQUIREMENTS**

**6.1** The 3-strand hawser-laid rope shall conform to the requirements given in Table 1 and 8-strand plaited rope shall conform to the requirements given in Table 2.

**6.2 Mass of the Coil**

The net mass of the coil containing 220 metres of rope including ties and lashing but not packing materials shall be as specified in Table 1 and Table 2 for 3-strand hawser-laid and 8-strand plaited respectively or as agreed to between the buyer and the seller or as entered in the despatch note subject to a tolerance given for linear density of the reference numbers ( diameter ).

**Table 1 Requirements for Polyamide Multifilament Ropes 3-Strand ( Hawser-Laid )**  
( *Clauses 6.1 and 6.2* )

Nominal Diameter ( Reference No. )	Mass per Coil ( 220 m Length )	Pitch or ( Length of Lay ), <i>Max</i>	Linear Density	Breaking Strength, <i>Min</i>
mm	kg	mm	kilotex	kgf
4	2.300	14	10.5	320
6	4.950	21	22.5	750
8	8.800	28	40	1 345
10	13.600	35	62	2 088
12	19.600	42	89	2 995
14	26.800	49	122	4 095
16	35.000	56	158	5 300
18	44.000	63	200	6 695
20	54.000	70	245	8 300
22	66.000	77	300	10 000
24	78.000	84	355	12 000
26	92.400	91	420	13 950
28	107.000	98	485	15 800
30	122.100	105	555	17 755
32	139.000	112	630	20 000
36	176.000	126	800	24 900
40	218.000	140	990	30 000
44	264.000	154	1 200	35 800
48	312.000	168	1 420	42 000
52	365.000	182	1 660	48 800
56	425.000	196	1 930	56 000
60	486.000	210	2 210	63 800
64	554.000	224	2 520	63 800
72	702.000	252	3 190	72 000
80	867.000	280	3 940	109 800
88	1 049.000	308	4 770	130 800
96	1 250.000	336	5 680	153 900
<b>Tolerance</b>				
4 mm to 8 mm	± 10 percent	—	± 10 percent	—
10 mm to 14 mm	± 8 percent		± 8 percent	
16 mm and above	± 5 percent		± 5 percent	
<b>Method of Test</b>	IS 7071 ( Part 2 ) : 1989	IS 7071 ( Part 3 ) : 1989	IS 7071 ( Part 2 ) : 1989	IS 7071 ( Part 4 ) : 1986
NOTE — 1 kgf = 9.8 N approximately.				

NOTE — In case coil contains rope length other than 220 metres, net mass shall be calculated from multiplication of linear density and rope length.

### 6.3 Length of Coil

The length of each coil when tested as per IS 7071 ( Part 2 ) : 1989 shall not be less than 220 metres or as declared. However, if so agreed between the buyer and the seller, the length of coil may be tested under zero tension and the following tolerances shall be applicable

on the specified/declared length:

<i>Reference Number</i>	<i>Tolerance</i>
Up to 14	±5 percent
Above 14	±3 percent

NOTE — Any coil which have been shortened by cutting from it, the necessary test samples shall be accepted at its original length and mass as part of the delivery provided that the test sample complies with the specified requirements.



**Table 2 Requirements for Polyamide Multifilament Ropes ( 8-Strand Plaited )**  
( *Clauses 6.1 and 6.2* )

Size Number	Nominal Diameter ( Reference Number )	Mass per Coil ( 220 m Length )	Pitch, <i>Max</i> Length of 10 Lays	Linear Density	Breaking Strength, <i>Min</i>
	mm	kg	mm	kilotex	kgf
1	8	8.8	30.4	40	
1.5	12	19.6	45.6	89	
2	16	35	61.0	158	5 300
2.5	20	54	76.0	245	8 300
3	24	78	91.2	355	12 000
3.5	28	107	106.4	485	15 800
4	32	139	122.0	630	20 000
4.5	36	176	136.8	800	24 900
5	40	218	152.0	990	30 000
5.5	44	264	167.2	1 200	35 800
6	48	312	192.4	1 420	42 000
6.5	52	365	197.6	1 660	48 800
7	56	425	212.8	1 930	56 000
7.5	60	486	228.0	2 210	63 800
8	64	554	243.2	2 520	72 000
9	72	702	273.6	3 190	89 900
10	80	867	304.0	3 940	109 800
11	88	1 049	334.4	4 770	130 800
12	96	1 250	364.8	5 680	153 900
13	104	1 425	395.2	6 660	182 140
14	112	1 698	425.6	7 720	210 200
15	120	1 951	486.0	8 870	240 200
16	128	2 222	480.4	10 100	272 140
17	136	2 508	516.8	11 400	306 220
18	144	2 816	547.2	12 800	344 224
20	160	3 476	608.0	15 800	422 440
Tolerance	Up to 8 mm	± 10 percent		± 10 percent	
	Up to 12 mm	± 8 percent	—	± 8 percent	—
	Above 12 mm	± 5 percent		± 5 percent	
Method of Test	IS 7071 ( Part 2 ) : 1989		IS 7071 ( Part 3 ) : 1989	IS 7071 ( Part 2 ) : 1989	IS 7071 ( Part 4 ) : 1986
NOTES					
1 Diameter is given for guidance only.					
2 1 kgf = 9.8 N approximately.					

#### 6.4 Identification

For identification of polyamide ropes, colour code as prescribed in IS 9560 : 1980 shall be followed.

#### 7 PACKING

All ropes shall be neatly coiled and suitably protected to prevent damage during transit.

NOTE — IS 3256 : 1980 may be followed for packing ropes intended for use within the country.

#### 8 MARKING

8.1 Each coil shall have securely attached labels at both ends carrying the following informations:

- Indication of the source of manufacture;
- Length of rope in the coil;
- Reference number of the rope; and
- Any other marking required by the buyer.

8.1.1 The coil may also be marked with the Standard Mark.

## 9 SAMPLING

### 9.1 Lot

A quantity of rope coils of the same linear density, type and dimensions, manufactured under similar conditions and delivered to a buyer against one dispatch note shall constitute a lot.

### 9.2 Sample Size

Sample shall be as representative as possible of the lot. Draw the samples at random at the rate shown by the following formula:

$$S = 0.4 \sqrt{N}$$

Where  $S$  is the number of lengths of rope and  $N$  is the size of the lot expressed as a number of 220 metres coils. When  $S$  as calculated is not a whole number, round off the value

obtained to give a whole number in accordance with IS 2 : 1960. In cases where  $S$  is less than 1, draw 1 sample length.

### 9.3 Criteria of Conformity

The lot shall be declared conforming to the requirements of this standard if the following conditions are satisfied:

- a) Length of each coil satisfies the specified/declared length;
- b) All the individual test samples tested for breaking strength satisfy the specified breaking strength. However, in case of failure of a test specimen drawn from a coil another specimen shall be retested from the same coil and the same shall satisfy the specified requirement;
- c) Average values of the test results of the lot in respect of other characteristics conform to the specified requirements.

## ANNEX A

### ( Clause 2 )

#### LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
2 : 1960	Rules for rounding off numerical values ( <i>revised</i> )	7071 ( Parts 1 to 3 ) : 1989	Ropes and cordages — Methods of physical test ( <i>first revision</i> )
3256 : 1980	Code for inland packaging of ropes and cordages ( <i>first revision</i> )	7071 ( Part 4 ) : 1986	Methods of physical test for ropes and cordages: Part 4 Breaking load and elongation at break
3871 : 1984	Glossary of terms relating to fibre ropes and cordage ( <i>first revision</i> )	7074 ( Part 4 ) : 1986	Methods of physical test for ropes and cordages—Breaking load and elongation at break
6359 : 1971	Method for conditioning of textiles	9560 : 1980	Colour code for identification of ropes and cordages

### **Standard Mark**

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

### Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

### Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference:

Doc : No. TX 09 ( 2657 )

### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

## BUREAU OF INDIAN STANDARDS

### Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002  
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha  
( Common to all Offices )

### Regional Offices :

Central : Manak Bhavan, 9 Bahadur Shah Zafar  
NEW DELHI 110002

### Telephone

{ 331 01 31  
{ 331 13 75

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola  
CALCUTTA 700054

{ 37 84 99, 37 85 61,  
{ 37 86 26, 37 86 62

Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036

{ 53 38 43, 53 16 40,  
{ 53 23 84

Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113

{ 235 02 16, 235 04 42,  
{ 235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri ( East )  
BOMBAY 400093

{ 632 92 95, 632 78 58,  
{ 632 78 91, 632 78 92

Branches : AHMADABAD, BANGALORE, BHOPAL, BHUBANESHWAR, COIMBATORE,  
FARIDABAD, GHAZIABAD, GUWAHATI, HYDERABAD, JAIPUR, KANPUR,  
LUCKNOW, PATNA, THIRUVANANTHAPURAM.